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Chapter 1. TRUE COSTS

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The way we live is causing enormous damage to ecosystems and communities around the world. The environmental and social impacts will be increasingly severe, costly, and tragic unless we make considerable lifestyle changes. Climate change is perhaps the most widely publicized issue, but there are many other serious problems, all of them driven in part by incomplete cost accounting. True cost accounting that considers most (if not all) impacts can help us make wiser decisions that add true value.

Many of the largest costs of our actions are currently ignored, uncounted, or incorrectly attributed. In the past, this has led us to treat symptoms rather than causes. As a result, global markets perform very poorly on any measure of sustainability. Social and environmental costs are ignored by governments and businesses, and are dismissed as "externalities" by economists. These externalities are left out of the pricing of goods and services but include the very large social costs related to pollution, disease, death, human suffering, lost productivity and community breakdown.

External costs also include damage to vital ecosystem services, depletion of nonrenewable resources, and other harm to Nature's Services and Natural Capital. Nature's Services include water and oxygen. Natural Capital includes natural resources, such as the standing stock of trees and groundwater on land and fisheries in the ocean. Many privately generated costs are passed on to workers, the public at large, and future generations. The burden falls hardest on the poor, people of color, and the powerless. Growth that ignores these social and natural costs is unsustainable. Our current embrace of unsustainable growth will punish the future generations who will pay the price.

There's been plenty of talk and international statements of accord on the need to control climate change gas emissions, but they continue to rise. The root cause of this failure is rarely addressed. As the Dutch say, *"No sense mopping the floor until you turn off the water."* We need to "turn off the water" with market reforms that address most if not all of the social and environmental costs of our current choices. Only then will the market function properly and sustainable solutions be embraced for a more secure and prosperous future.

We also need to improve how we consider the value of assets currently missing from most accounting systems. These include people's health, skills, intelligence, and initiative. The vitality of communities and cultural cohesion are rarely valued. And we must also consider the contributions of Nature's Services through healthy ecosystems; the value of renewable and nonrenewable resources, antibiotic effectiveness, and other critical but vulnerable biological assets.

Ignoring the value of these assets has contributed to many of our worst problems. Much better accounting is needed to develop more sustainable management practices at all levels, from the individual to the family, neighborhood, community, sector of the economy, piece of land, watershed, water body, company, forest, farm, and nation. Monitoring and reporting asset values over time often reveals that operations thought to be profitable today are not so, either now or in the long run. The true asset values are commonly declining or collapsing.

A popular bumper sticker in the mining communities of the West reads "If it isn't farmed, it's mined." Unfortunately, most potentially sustainable resources are being mined as well. If a harvest exceeds its rate of regrowth or recovery, then Natural Capital is being mined. Forestry, fisheries, ground water, soils, and farmland are being mined, and they are not likely to be managed better until asset values are tracked and reported.

Assets that have historically been ignored by economists are a crucial part of the value equation. Considering only money and property while ignoring Natural and Social Capital as well as Nature's Services provides an incomplete and dangerous view of the world. More complete asset value considerations encourage a more complex, time-linked view from the past to the future. Life cycle costs and benefits are important and stewardship should be measured in decades or generations, not months, quarters, and years.

When facilities, products, and equipment are cared for and properly maintained, they will last for decades or longer and reduce the impact on climate change. Irv Gordons's 1966 Volvo P1800 passed the three-million-mile mark with the original engine block and transmission. My 1923 Singer sewing machine is still working well as it nears 100 years of service. Good design and good maintenance reduce environmental impacts.

Few companies today are concerned about longevity or social equity. Too often the goal is short-term profit with "the lowest price at any cost." Companies also face stakeholders' expectations for ever-increasing size (like a cancer) and profit. Moving production to the lowest cost country with the cheapest labor and few (if any) environmental and social rules fits Chicago School economist Milton Friedman's 1970 argument that, " . . . *there is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profits*." In this view, only money matters.

The Changing Tide

Friedman's philosophy has been the dominant vision, but it has lost ground and modest progress has been made in improving corporate responsibility. The Global Reporting Initiative (GRI) was launched in 1997 to encourage sustainability reporting from companies and organizations. There is still much to be done to strengthen the economic sections of these reports. Most external costs are neglected, even fewer are monetized, and the financial risks of climate change may not be covered.

The 2021 UN climate change Conference of the Parties, COP26, provided little except more words, but governments are taking action. Larger Swedish and British firms now have to report climate impact. In the UK, firms and organizations will have to begin making "climate-related financial disclosures." The US Securities and Exchange Commission is exploring options for reporting external impacts, but has not advocated true cost reporting yet. The Supreme Court's decision (2022) to gut the Environmental Protection Agency is likely to further delay the American response. The European Union requires some types of reporting and has also taken steps to improve oversight and review. These efforts have focused on big companies and the financial industry.

Progress is being made and thousands of companies have completed Global Reporting Initiative (GRI) reports. The staff at GRI has worked hard with stakeholders to improve the value of this kind of reporting. International accounting groups are also working hard to improve true cost reporting. Corporations need to rise to the challenge because governments clearly cannot do it all by themselves. The nonprofit B Lab has provided a framework for more than 4,000 certified B-corporations in more than 70 countries and over 150 industries that now balance profit and purpose for a sustainable future (https://bcorporation.net/about-b-corps). These organizations are in many ways the opposite of Milton Friedman's "for profit only" corporation. They meet high standards for verified social and environmental performance, public transparency, and legal accountability—but they don't yet count true costs.

Some companies have gone further and prepared true cost estimates. Bulmers Cider was one of the first, with an excellent report by David Bent at the Forum for the Future. Bulmers followed up with changes in their

operations and with a study of the true cost of their cider orchards. Others have followed, and an emerging group of true cost accountants is taking up the challenge. The results are often surprising, with external costs greater than profits.

One day we will be able to see true costs at the store. The first True Price store opened in Amsterdam in 2021. This market includes the true cost of products alongside the typical retail value. A chocolate bar that would otherwise sell for $3.12 has a true price of $4.11. A pair of jeans that would sell for $50 has a true cost of $90. Consumers are encouraged to pay the true cost, the added income from which goes toward supporting education and research to count environmental and social impacts. The largest share of the cost increase has been to reduce labor exploitation.

The consulting firm Deloitte's Amsterdam office, known as "the Edge," has set up a true price coffee bar. Will employees and office visitors be inclined to pay the actual price (including environmental and social costs) or adjust their consumption behavior?

Challenges to Transition

Our dependence on natural systems would not be a problem if we did not take more from the earth than we give back and did not dump more waste than nature can absorb and detoxify. By any measure, this imbalance is creating global climate change, extensive and of-ten severe health problems (particularly for the poor), healthcare costs (20 percent of US GDP), societal crises, environmental refugees, destruction of ecosystems, the collapse of important fisheries, and species extinction.

High external social costs arise from this race to the bottom. Companies following Friedman felt justified in moving production offshore to havens where labor exploitation was allowed and the adverse physical and mental health impacts of manufacturing— exposure to toxins, chemicals, and pesticides; reduced lifespan; prejudice and discrimination; and destruction of once stable communities—could be ignored. Even in the US and other wealthy nations, these very real costs are ignored, uncounted, or incorrectly attributed.

Many of these privately generated costs are passed on to the public and to future generations. One exploration of the long-term impacts of climate change suggested that the true cost of a ton of carbon might be more than $10,000 and perhaps as high as $750,000. However, the US currently considers that cost to be $50; Sweden, $137.50. The transfer of costs to "others" has helped many companies and individuals to get rich. Some use their wealth to address global problems, but many others use this power to defend their willful neglect of social and environmental costs.

The Problem with Subsidies

Powerful interests develop and defend their cash subsidies, the perverse effects of which are well known. They were first described by Adam Smith in 1776 when he wryly quipped, *"It has, I am afraid, been too common for vessels to fit out for the sole purpose of catching, not the fish, but the bounty."* Subsidies increase revenue flow to special interests that reap the benefits in return for large political contributions. In this way, subsidies are used to maintain political power and suppress dissent.

Subsidies for environmentally friendly technology are increasingly touted as a necessary policy improvement—but the government has not proven to be a wise investor. In California I saw fake windmills that were built to take advantage of early subsidies for renewable energy. Solar cell company Solyndra went bust,

despite the subsidized government loan of $570 million. Abound Solar lost another $401 million. The battery company Ener1 blew $118 million in federal subsidies and also went broke. The solar power towers in the desert cost hundreds of millions of dollars and were flawed from the beginning. Many other government "investments" have been equally flawed.

The choices for more sustainable options are best offered by a free market with true cost accounting. Rather than subsidizing clean energy, we should end the direct and external cost subsidies for fossil fuels—which far exceed those for clean energy and which globally amount to more than $500 billion every year. Agricultural sector subsidies in the US can reach $20 billion a year and result in enormous adverse health and environmental impacts we can ill afford.

These subsidies come in many forms, including direct payments, low-cost loans, below-cost services, tax credits and exemptions, indirect payments (e.g., market protection, below-cost money, allowed environmental damage), free access to land or resources, insurance against predictable risks, and protection from liability for direct and external costs. These subsidies hide market signals and protect industries from liability for damages to the global climate, public health, communities, and the environment. They encourage inertia and waste while stifling innovation. Subsidies also tend to have very high transaction costs. Rather than working for the public good, they too often create public illth.

Rather than charging for lost resources and future risks, the government currently rewards those who deplete resources—still providing tax subsidies to the oil and gas industries that are worth billions of dollars, year after year. In 1926, Congress approved the "depletion allowance," which let oil producers deduct more than a quarter of their gross revenues. Texas senator Tom Connally, who sponsored the break, admitted, *"We could have taken a 5 or 10 percent figure, but we grabbed 27.5 percent because we were not only hogs but the odd figure made it appear as though it was scientifically arrived at."* In 2002, this mine and fossil fuel depletion deduction cost the government nearly $10 billion in lost revenue.

Independent oil and gas (and other mineral fuel) operations can still deduct 15 percent of their gross income from production, rather than simply writing off the actual cost. The Depletion Deduction allows fossil fuel companies and mine operators to deduct an amount equal to the reduction in value of their assets as the mineral is extracted and sold. This costs the government about one billion dollars each year. The Intangible Drilling Costs Deduction allows companies to deduct a majority of the costs incurred from drilling new wells domestically—this also costs us about one billion dollars each year. The Clean Coal program also garners a $1B per year subsidy. The timber industry gets a smaller but equally foolish depletion allowance; theirs is subtracted from the timber sale proceeds to compute the taxable gain or loss. Get paid for destroying resources!

Global Climate Change as an Example

Global climate change is a clear case of failed accounting. It illustrates many of the challenges and potential benefits of true cost accounting. CCGs (climate change gases) include carbon dioxide, methane, nitrous oxide, and fluorinated gases. Carbon dioxide is considered the base global warming gas and assigned a global warming potential of 1. Methane's global warming potential is 28-36 times greater, nitrous oxide is 265-298 time more potent, and the fluorinated gases are thousands or tens of thousands of times worse.

The impact of CCGs is related to their residence time in the atmosphere. When chlorofluorocarbons (CFC) contain hydrogen in place of one or more chlorines, they are called hydrochlorofluorocarbons, or HCFCs. Some

of these gases will remain in the atmosphere for 50,000 years. Sulfur dioxide is regarded as an indirect greenhouse gas because when coupled with elemental carbon, it forms global warming aerosols that can come down as acid rain. A growing number of people are aware of climate change risks, and programs and news reports appear almost daily. But little progress has been made in reducing these emissions because the key factor of cost has been ignored.

Reporting of carbon impacts has improved, but the critical step of true cost accounting has not been addressed. Only this can ensure that climate change can be minimized and that there will be more efficient, comfortable, and safe housing, healthful foods, clean drinking water, adequate medical care, and security. Reform will not be easy. The current set of subsidies, incentives, and regulations has created powerful special interest groups that are very effective at protecting themselves from considering the external costs of climate change. The fossil fuel industry spends millions of dollars every year to confuse the issue and avoid responsibility. In 1968, Exxon's profit was $1.2 billion—just a bit less than the tax revenue for the state of California. Power not to the people.

More than fifty years ago, Elmer Robinson and R. C. Robbins at the Stanford Research Institute prepared a report for the American Petroleum Institute that noted the rise of global warming gases and discussed the cause: " . . . none seems to fit the presently observed situation as well as the fossil fuel emanation theory." The paper warned that continued warming could melt ice caps, increase sea levels, change fish distributions, and increase plant photosynthesis. Forty years ago, Roger Cohen, then director of the Theoretical and Mathematical Sciences Laboratory at Exxon, stated: "*The consensus is that a doubling of atmospheric CO_2 from its pre-Industrial Revolution value would result in an average global temperature rise of 5.4 ±1.7 °F. There is unanimous agreement in the scientific community that a temperature increase of this magnitude would bring about significant changes in the earth's climate, including rainfall distribution and alterations in the biosphere.*"

Exxon chose to deny their own research. In 1998, the American Petroleum Institute organized a $5 million plan to challenge the science of climate change. Following the success of Big Tobacco in denying the health risks of smoking, Exxon, Peabody Coal, the Western Fuels Association, and many others contributed tens of millions to debunk climate science. They even hired the same public relations firms that had protected the death merchants at the tobacco companies. Exxon would continue funding climate contrarian "research" until 2015, and perhaps even under cover today.

Conservative "think tanks" have written articles and books, developed social media campaigns, and given talks on the "junk science" that was discovering the adverse effects already being seen and felt as well as the future risks of climate change. Of 141 books critical of climate science published up to 2005, 92 percent were from conservative think tanks. These have cast the scientists and sustainability supporters as evil threats to Western civilization. They not only attack the science, but the individual scientists as well, much like the McCarthy era attacks on liberals. The American Academy for the Advancement of Science has reported that US scientists have received many threats and abusive emails. Conservative lawmakers and activist groups have sought detailed disclosure of records from climate researchers, asking their universities to turn over thousands of emails and documents. Virginia attorney general Ken Cuccinelli, a climate change skeptic, demanded many of the same documents in the hope of showing that a scientist had somehow defrauded taxpayers in obtaining research grants. NASA was sued to disclose records detailing climate scientist James Hansen's compliance with federal ethics and disclosure rules. In Australia, top climate scientists have been targeted by an unrelenting

email campaign that has resulted in police investigation of death threats. This is like a homeowner suing the fire department for trying to put out the flames as their house burns down.

All of this disinformation has paid off. In 2020, only 55 percent of right-leaning respondents said that they believe warming will hurt them at least a moderate amount. In a 2019 survey, a remarkable number of Americans—15 percent—felt the climate was not changing or was unaffected by human activity. A surprising number of respondents in another survey said they expect global warming will *help* them personally. The expenditures supporting denial have helped build a growing share of people who don't believe scientists on any issue, which has made dealing with the COVID-19 pandemic more difficult and has led to many avoidable deaths. One of the great challenges in the years ahead will be reaching out to the denial community. They have children, grandchildren, and hopes for the future, but unless denial can be overcome, that future may be grim indeed.

Two states have launched fraud investigations of Exxon's public disinformation campaign about climate risks in denial of their own early science studies. New York lost, but the case in Massachusetts is still in play. Nine cities and counties, from New York to San Francisco, have sued major fossil fuel companies, seeking compensation for climate change damages. The victims of Hurricane Ida could probably make a case for their losses. Developing countries hit hard by climate change could sue the US and EU members for damages.

Young people are filing lawsuits around the world, claiming their governments have an obligation to safeguard the environment. The Supreme Court of the Philippines agreed that these cases have standing. However, these strategies are unlikely to succeed with conservative courts that are selected and supported by the most powerful people with the dirtiest hands. Still, there may be surprises. In a groundbreaking judgment delivered on May 26, 2021, the Hague District Court ordered Royal Dutch Shell to reduce its worldwide CO_2 emissions by 45 percent by 2030.

Opportunity and Challenge

With true cost accounting, we can find better ways to meet basic human needs that protect the environment, families, and communities, as well as future generations. Access to resources and opportunities must be more equitable. Society needs to favor the industrious, kind, creative, frugal, and compassionate—not the greediest. We need policy that conserves resources and future options. We need to revoke subsidies and legal protections that enable individuals, governments, and corporations to avoid responsibility for climate change emissions and health and environmental damage.

It is important to better understand the magnitude of the risks we face. Despite considerable investment and research, the global impacts of climate change remain only partially understood. The rapid intensification of Hurricane Ida from a Category 1 to Category 4 storm is a good example. It caught everyone by surprise. The US Hurricane Center's definition of rapid intensification is at least a 35 mph increase in wind speed in 24 hours, but Ida strengthened that much in just six hours! Climate change may require two new categories of hurricane strength. A Category 6 hurricane would start with winds of 180 mph. A Category 7 hurricane would have winds of at least 210 mph. Hurricane Dorian in 2019 would have rated as a Category 6. Hurricane Patricia in 2019 would have been a Category 7 with its sustained winds of 215 mph.

The size category of a hurricane doesn't give full credit to the problems hurricanes cause. Ida came ashore as a Category 4 in August 2021 and caused tremendous damage. Human suffering and loss of life was intense.

At the peak, 1.1 million people were without power during the steaming hot summer days. Ten days after the hurricane hit, the governor reported 271,000 people were still without power. In 2008, the Natural Resources Defense Council suggested that climate change would lead to hurricane damage of $43 billion in 2050 and $142 billion in 2075. They were far too conservative. The damage from Hurricane Ida in 2021 approached $100 billion—36 years before that level of impact was expected!

Tipping Points

A tipping point is reached when a small change has unexpected impacts that lead to a sudden cascade of events. For example, research suggests that the rapid melting of the Greenland ice sheet may be slowing the Atlantic Meridional Overturning Circulation Current. This important Atlantic Ocean current transports heat from the southern to the northern hemisphere and affects rainfall around the planet. Decay or collapse of the current could dramatically increase winter cold temperatures in Europe and disrupt the monsoon rains critical to food production for 1.5 billion people. It will likely be impossible to restart the current if it fails.

True cost accounting is a critical step in combatting climate change, encouraging more sustainable resource management and reducing the risk of unanticipated tipping points. A year after Jim Hansen's testimony to Congress on climate change in 1987, the United Nations World Commission on Environment and Development report titled "Our Common Future" defined sustainability as *" . . . development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs."* The report highlighted the necessity of addressing poverty and inequity in preventing continued environmental deterioration.

We can use true cost accounting to create an economic system that is sustainable and improves the environment and the quality of people's lives around the world. The market will have to be re- shaped to include consideration of life cycle costs and benefits, asset values, and clear cost estimates of current and future impacts on the environment and social systems, both globally and locally. This will require a better educated citizenry and a culture of sustainability. The younger generations are already getting there.

Awareness of the serious problems with global climate change, local and global ecosystem stability, resource availability, and sustainability is increasing in the scientific and business communities. Consumers are also getting the message. In Germany, for instance, the share of the population "very concerned" about the personal ramifications of global warming has increased 19 percent since 2015 (from 18% to 37%). In Canada, about 34 percent of the public are truly "alarmed" by climate change. In Sweden, two-thirds of eighteen to twenty-nine-year-olds are at least somewhat concerned about the personal impacts of climate change in their lifetime, compared with just 25 percent of those 65 and older. Seventy-five percent of respondents in the Philippines and 74 percent in Vietnam said they thought climate change would have "a great deal of impact" on their lifestyles, while 19 percent from both countries said they thought it would have "a fair amount of impact." Similarly, 94 percent of respondents from Thailand felt climate change would have a "great deal" or "fair amount" of impact on their lifestyles.

A recent Boston Consulting Group (BCG) survey of more than 3,000 people across eight countries found the pandemic has led people to be more concerned about addressing environmental challenges and to be more committed to changing their own behavior to advance sustainability. Some 70 percent of survey respondents said they are more aware now that human activity threatens the climate and that degradation of the environment,

in turn, threatens humans. The survey also found that people want to see aggressive action on the environmental front. More than two-thirds of respondents thought that economic recovery plans should make environmental issues a priority. The BCG study also showed that crisis is driving change at the individual level, with 40 percent reporting their intent to adopt more sustainable behaviors. The PwC consulting firm global survey in 2021 found that half of the consumers surveyed globally said they have become more eco-friendly in the past six months. In 2019, a PwC study found that almost half of the Canadians were willing to pay a premium for organic food items. Two-thirds of the Canadians cared first and foremost about buying local products and were willing to pay a premium for them.

In the US, only 27 percent of the respondents were "very concerned," about climate change, but most liberals were willing to make changes to reduce climate change impacts—far fewer conservatives would do the same. Younger people are rightfully more concerned. In a 2021 Pew survey, two-thirds of Gen Zers in the US as well as 61 percent of millennials said they had talked with friends or family about the need for action on climate change in the past few weeks.

The tide is turning. Now is the time to bring true cost accounting into wide use. Accountants need to be more involved. The American Institute for Certified Public Accountants (AICPA) is getting involved. Andrew Harding (fellow of the Chartered Institute of Management Accountants, a chartered global management accountant, and the association's chief executive for management accounting) noted the change in 2021, "*We believe that we will see profound changes in the next few years in the work of management accounting and public accounting to embed new practices and standards relating to sustainability. The Association will continue to provide education and guidance to all areas of the profession, ensuring that it is ahead of this transformation.*"

The following chapters help show how this can be done by improving analysis and reporting. We can save the future with true cost accounting. It is time for you to get involved!

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The definition of ACCOUNTABILITY in the Merriam Webster dictionary: ***A willingness to accept responsibility and account for one's actions.*** More info at www.truecostalways.com

About the author

I grew up in the Western US, spending my formative years in the dry lands east of the North Cascade mountain ranges. I completed a BA in Earth Sciences at UC San Diego and MS in Ecology at UC Davis. My research on passive solar heating and cooling in the 1970s led to the Passive Solar Pioneer Award from the American Solar Energy Society in 2004. In the 1980s I started research on sustainable agriculture and desert and dryland restoration and completed many projects for a range of clients, including the Sustainable Agriculture Research and Education Program, National Parks, BLM, US Forest Service, State Parks, California Department of Transportation and the Department of Defense. In 1995 I returned to the classroom and retired in 2010 after fifteen years as Associate Professor of Sustainable Management at Alliant International University. I taught graduate and undergraduate courses on resources, ethics, management, and economics. I won university awards for teaching, research and community service. My research focus in recent years has been on environmental history and true cost accounting. www.sustainabilityleader.org